

greater than would be the case for uniform capillary flow along the surface.

14. The rate at which the snow is melted depends on the rate at which heat can be absorbed by the snow surface per unit area with air at the given temperature. The writer's experiments indicate that the melting constant is about 0.04 to 0.06 inch depth of water per 24 hours per degree of temperature above 32°F. Loose snow apparently absorbs heat at about the same rate as packed snow, but as the water equivalent of the former is lower, its rate of disappearance is much more rapid.

15. When snow overlies unfrozen ground, or frozen but porous and unsaturated soil, most of the water from melting percolates to the bottom of the snow layer and thence into the soil. The melting of snow or warm rain falling upon a snow cover under suitable conditions, is thus more favorable to the replenishment of ground water than would be an equal volume of rainfall on a bare surface, since in the presence of snow, surface runoff is greatly retarded and the opportunity for infiltration increased.

16. Under suitable conditions and especially in the woods where the ground is least frozen, a deep layer of snow on level ground may wholly disappear by invisible percolation without causing any surface run-off whatever. Where there is opportunity for infiltration, the melting of snow contributes more to the ground water and less to the surface run-off than would an equal volume of rain on a bare surface, and by providing a high ground-water level, the effect of the melting of snow cover may be felt for a longer time after the snow has disappeared than if an equal volume of rain had fallen at the same time.

METEOROLOGY AND SEISMOLOGY AT THE PAN AMERICAN SCIENTIFIC CONGRESS.

By C. FITZHUGH TALMAN, Professor of Meteorology.

[Dated: Weather Bureau, Washington, Jan. 20, 1916.]

In the Second Pan American Scientific Congress, which met in Washington from December 27, 1915, to January 8, 1916, inclusive, meteorology and seismology were represented by a subsection of Section II. All sessions were held in the auditorium of the Carnegie Institution.

On Tuesday morning, December 28, the Subsection on Meteorology and Seismology met in conjunction with the Subsection on Astronomy and Geodesy. Dr. R. S. Woodward, chairman of Section II, addressed the meeting, after which administrative business of the section was disposed of and a program of astronomical and geodetic papers was presented. The first separate session of the Subsection on Meteorology and Seismology was held on the afternoon of December 28.

The attendance in this subsection was gratifyingly large, and this branch of the Pan American Scientific Congress was probably more fully representative of the meteorological and seismological activities of the Americas than any scientific gathering ever before held. Owing to the length of the program, it was found necessary, after the first session, to read by title all papers the authors of which were not in attendance.

The following meteorologists and seismologists attended one or more of the sessions as members of the Congress:

Dr. C. G. Abbot, Smithsonian Institution, Washington.
Dr. H. Arctowski, New York Public Library, New York.
Prof. S. I. Bailey, Harvard College Observatory, Cambridge, Mass.

Dr. L. A. Bauer, Carnegie Institution, Washington.
E. A. Beals, U. S. Weather Bureau, Portland, Oreg.
Prof. W. R. Blair, U. S. Weather Bureau, Washington.
E. H. Bowie, U. S. Weather Bureau, Washington.
C. F. Brooks, Yale University, New Haven.
Prof. J. E. Church, jr., University of Nevada, Reno.
Dr. H. H. Clayton, Oficina Meteorológica Argentina, Buenos Aires.
Dr. I. M. Cline, U. S. Weather Bureau, New Orleans.
Prof. H. J. Cox, U. S. Weather Bureau, Chicago.
Prof. O. L. Fassig, U. S. Weather Bureau, Baltimore.
Prof. H. C. Frankenfield, U. S. Weather Bureau, Washington.
Rev. A. Galán, S. J., Woodstock College, Woodstock, Md.
Rev. M. Gutierrez-Lanza, S. J., Belén College, Habana.
Prof. A. J. Henry, U. S. Weather Bureau, Washington.
Prof. W. H. Hobbs, University of Michigan, Ann Arbor.
Prof. W. J. Humphreys, U. S. Weather Bureau, Washington.
Prof. E. Huntington, Yale University, New Haven.
Dr. T. A. Jaggard, Volcano Observatory, Hawaii.
Prof. H. H. Kimball, U. S. Weather Bureau, Washington.
Dr. C. J. Kullmer, Syracuse University, Syracuse, N. Y.
Dr. L. Landa, director general of public instruction, Honduras.
Dr. C. Lurquin, director, Observatorio Meteorológico del Instituto Médico, Sucre, Bolivia.
Prof. C. F. Marvin, chief, U. S. Weather Bureau, Washington.
Ing. J. C. Millás y Hernández, subdirector of the National Observatory of Cuba, Habana.
Dr. F. E. Nipher, Washington University, St. Louis.
W. G. Reed, Office of Farm Management, Department of Agriculture, Washington.
Rev. S. Sarasola, S. J., director, Observatorio del Colegio de Montserrat, Cienfuegos, Cuba.
Prof. J. Warren Smith, U. S. Weather Bureau, Columbus.
Dr. W. F. G. Swann, Carnegie Institution, Washington.
Prof. C. F. Talman, U. S. Weather Bureau, Washington.
A. E. Thiessen, U. S. Weather Bureau, Salt Lake City.
Rev. F. A. Tondorf, S. J., Georgetown University, Washington.
J. F. Voorhees, U. S. Weather Bureau, Knoxville.
Prof. R. DeC. Ward, Harvard University, Cambridge, Mass.
E. L. Wells, U. S. Weather Bureau, Boise.
Dr. R. S. Woodward, president, Carnegie Institution, Washington.

The attendance included, in addition to these persons, several officials and employees of the Weather Bureau and others who were not members of the Congress.

A brief account of the proceedings follows:

SECOND PAN AMERICAN SCIENTIFIC CONGRESS, WASHINGTON, DECEMBER 27, 1915—JANUARY 8, 1916.

MINUTES OF SUBSECTION IIB, METEOROLOGY AND SEISMOLOGY.

First session, Tuesday, December 28, 1915, 2:30 p. m.—The meeting was called to order by Prof. C. F. Marvin, chairman of the subsection, who delivered an address of welcome.

The following papers were read: *

*"Investigations on the prediction of barometric variations." Rev. S. Sarasola, S. J.
Discussion by Messrs. Lurquin and Frankenfield.
*"Origin and course of West Indian hurricanes." J. C. Millás.
Discussion by Messrs. Sarasola and Gutierrez-Lanza.
"Thunderstorms." W. H. Alexander. (Read by Prof. A. J. Henry.)
Discussion by Messrs. Church, Clayton, and Peabody (of Section I).
"Agricultural meteorology." Prof. J. Warren Smith.
Discussion by Messrs. Church, Frankenfield, and Voorhees.

Second session, Wednesday, December 29, 1915, 2:30 p. m.—Prof. C. F. Marvin, presiding.

Dr. Woodward announced the membership of the committee on resolutions, which he had been authorized to appoint at the first general meeting of the section, viz: Dr. Woodward (chairman), Prof. Marvin (U. S. A.), Sr. Millás (Cuba), Dr. Clayton (Argentina), and Prof. Morandi¹ (Uruguay).

*Papers whose titles are preceded by an asterisk are published in abstract on another page of this REVIEW. Some of the papers presented will appear in full in later issues of the REVIEW—C. A., Jr.

¹ Prof. Morandi was found not to be in attendance at the congress, and was replaced by Dr. Lurquin (Bolivia.)—C. F. T.

The following papers were read:

*"Climatic control of cropping systems and farm operations." J. F. Voorhees.

Discussion by Messrs. Fassig and Smith.

*"The climate of Cuba." Rev. M. Gutierrez-Lanza, S. J.

Discussion by Mr. Millás.

"The pleistocene fluctuations of climate." Dr. H. Arctowski.

Discussion by Messrs. Huntington, Clayton, Hobbs, and Kullmer.
*The Ferrel doctrine of polar calms and its disproof in recent observations. Prof. W. W. Hobbs.

Discussion by Clayton.

"The meteorological influences of lakes." E. R. Miller. (Read by title.)

*"The position of meteorology among the sciences." C. F. von Herrmann. (Read by title.)

Third session, Thursday, December 30, 1915, 9:30 a. m.—
Prof. C. F. Marvin, presiding.

The following papers were read:

"Frequency, amount, and characteristics of rainfall and hailstorms at Villa Colón, Montevideo, from 1888 to 1914." Luis Morandi. (Read by title.)

"The River Plata." ² Hamlet Bazzano. (Read by title.)

*"The climate of Salt Lake City." A. H. Thiessen.

Discussion by Messrs. Fassig and Wells.

*"The economic aspects of climatology." Edward L. Wells.

Discussion by Prof. Smith.

*"Sleet and ice storms in the United States." Prof. H. C. Frankenfield.

Discussion by Messrs. Henry, Arctowski, Brooks, and Blair.

"Forecasts of weather favorable to the increase of forest fires." E. A. Beals.

Discussion by Messrs. Wells and Henry.

Fourth session, Friday, December 31, 1915, 2:30 p. m.—
Prof. C. F. Marvin, presiding.

The following papers were read:

*"Monthly storm frequency in the United States." Prof. C. J. Kullmer.

Discussion by Messrs. Henry, Arctowski, and Huntington.

"The thunderstorms of the United States as climatic phenomena." Prof. R. DeC. Ward.

Discussion by Messrs. Cox and Arctowski.

*"Solar activity, cyclonic storms and climatic changes." Prof. Ellsworth Huntington.

Discussion by Prof. Nipher.

"The influence of the Great Lakes upon the movement of high and low pressure areas." Prof. H. J. Cox.

Discussion by Messrs. Church, Henry, and Clayton.

"The duration and intensity of tropical rains." Prof. O. L. Fassig.

Fifth session, Monday, January 3, 1916, 9:30 a. m.—
Prof. C. F. Marvin, presiding.

The following papers were read:

*"Climatic fluctuations in historic times." Rev. Antonio Galán, S. J.

Discussion by Father Gutierrez-Lanza.

*"Temperature conditions at New Orleans, as influenced by sub-surface drainage." Dr. I. M. Cline.

Discussion by Messrs. Smith, Cox, Nipher, Clayton, Fassig, and Humphreys.

*"Snow surveying—its problems and their solution." Prof. J. E. Church.

Discussion by Messrs. Thiessen and Wells.

"Introduction to the study of the solar relations of meteorology." German Barbatto and Pedro Esquerré. (Read by title.)

"The Callendar sunshine recorder." Prof. A. E. Douglass. (Read by title.)

"Measurements of the intensity of solar and sky radiation." Prof. H. H. Kimball.

Discussion by Dr. Bauer.

*"Atmospheric electric observations aboard the 'Carnegie'." Dr. W. F. G. Swann.

Discussion by Messrs. Humphreys and Bauer.

"Frost in the United States." Wm. Gardner Reed.

Discussion by Messrs. Fassig, Clayton, and Voorhees.

"Some results of aerological observations." Prof. W. R. Blair.

Sixth session, Wednesday, January 5, 1916, 9:30 a. m.—
Prof. C. F. Marvin, presiding.

The following papers were read:

*"Fog forecasting in the United States." Prof. H. C. Frankenfield. (Read by title.)

"River service of the Weather Bureau." Prof. A. J. Henry. (Read by title.)

"The principles involved in predicting high-water stages in 'flashy' streams, with special reference to the scheme for the Savannah River at Augusta, Ga." E. D. Emigh. (Read by title.)

"Forecasts of river stages and floods in the Ohio Valley—their importance to commerce and in conserving life and property." W. C. Devereaux. (Read by title.)

"The principal geophysical bases of modern seismology." Dr. Santiago I. Barbarena. (Read by title.)

"Organization of macroseismological observations in America." Count de Montessus de Ballore. (Read by title.)

*"Wind velocity and elevation." Prof. W. J. Humphreys.

"The collection of seismological data in the United States." Prof. W. J. Humphreys.

Discussion by Dr. Jaggard.

Dr. Woodward, chairman of the section, read a resolution drawn up by the committee on resolutions, as follows:

Whereas the First Pan-American Scientific Congress formulated and voted the following resolution: "The Fourth Scientific Congress (First Pan-American) recommends to the American Republics the installation of meteorological organizations to serve as a basis for the establishment of a Pan-American meteorological service, which is also recommended":

Resolved. That the Second Pan-American Scientific Congress confirms this resolution, and adds that it is most desirable for the Republics not yet possessing organized official meteorological services to establish such as soon as practicable.

This resolution was unanimously adopted, for submission to the executive committee of the congress.

*"Bolivian meteorology." Dr. Constant Lurquin.

Discussion by Father Sarasola.

"First steps of Venezuela in the field of meteorology." Dr. Luis Ugueto. (Read by title.)

*"General organization of the services of the National Meteorological Bureau of Uruguay." Hamlet Bazzano. (Read by title.)

*"Present condition of meteorology and seismology in Honduras." Luis Landa.

"Résumé of the organization of the meteorological service of Chile." (Contributed by the Instituto Central Meteorológico y Geofísico de Chile. Read by title.)

"National Observatory of the Republic of Cuba. Brief sketch of the services established under the direction of this observatory." Luis G. y Carbonell. (Read by title.)

"The Argentine meteorological service." H. H. Clayton.

Discussion by Messrs. Smith and Talman.

"Contributions to Colombian meteorology." Jorge Alvarez Herra. (Read by title.)

"The organization of meteorology and seismology in the United States." Prof. C. F. Marvin.

The chairman brought before the attention of the meeting a proposal to form a Pan-American Meteorological Association, which was referred to the members for informal discussion after the session.

A vote of thanks was extended to the Carnegie Institution for the use of the auditorium.

On motion of Dr. Lurquin a vote of thanks was extended to the United States Government and to Prof. Marvin and other officials of the United States Weather Bureau for their collaboration in the work of the subsection and for hospitalities accorded the members.

C. F. TALMAN,
Secretary, Subsection IIB.

²The spelling here followed is that adopted by the United States Board on Geographic Names.—Editor.